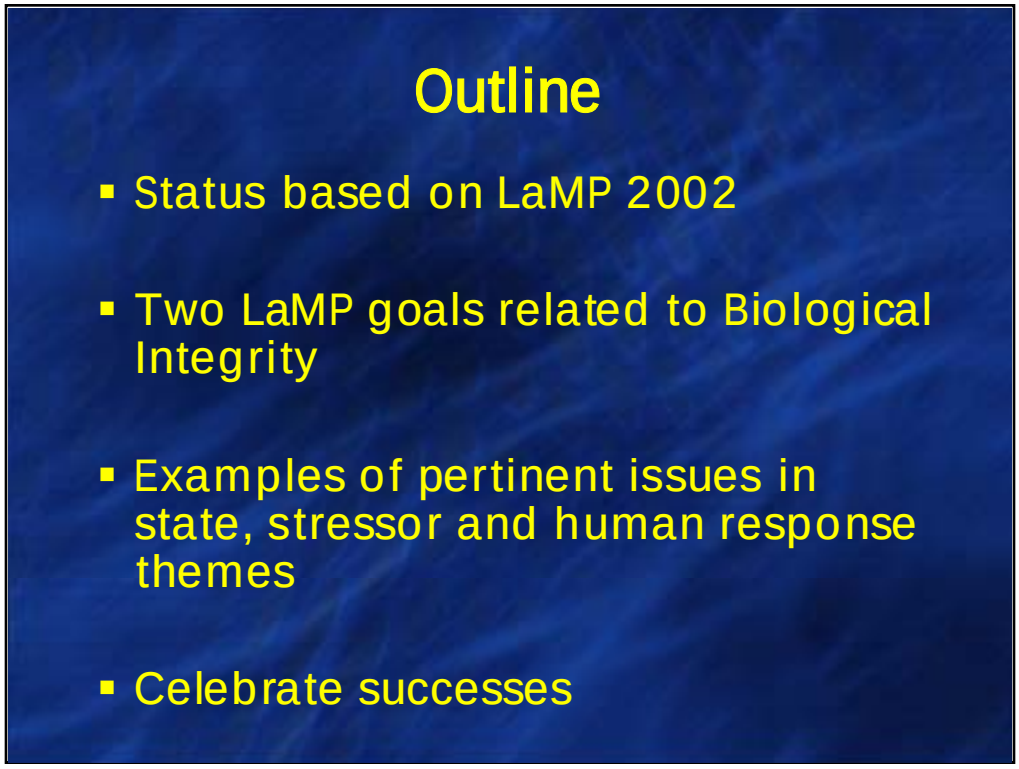
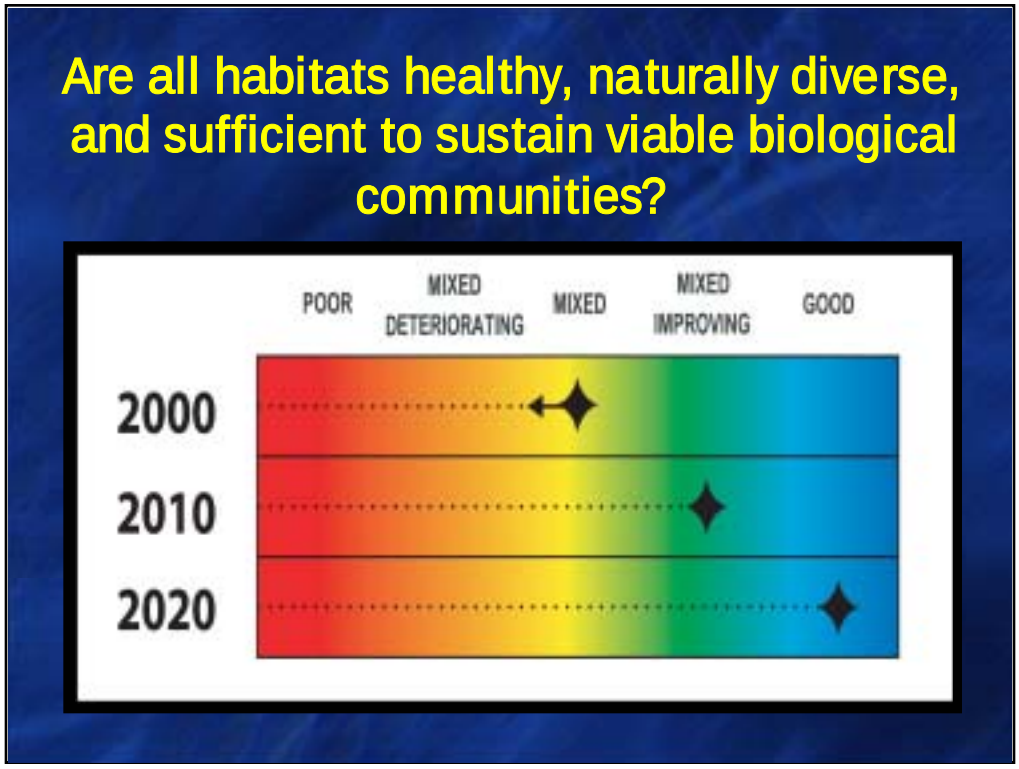
I am a citizen and a landowner of the east end of the Lake Michigan Watershed. My part of it even has some habitat for wildlife and a few non-native species. Befitting a descendant of European border-staddlers, it is close to both the Lake Huron and St. Clair Watershed boundaries, and is actually closer to both their Great Lakes shores. Being in the middle, geographically, and otherwise, is common when talking about this Great Lake.



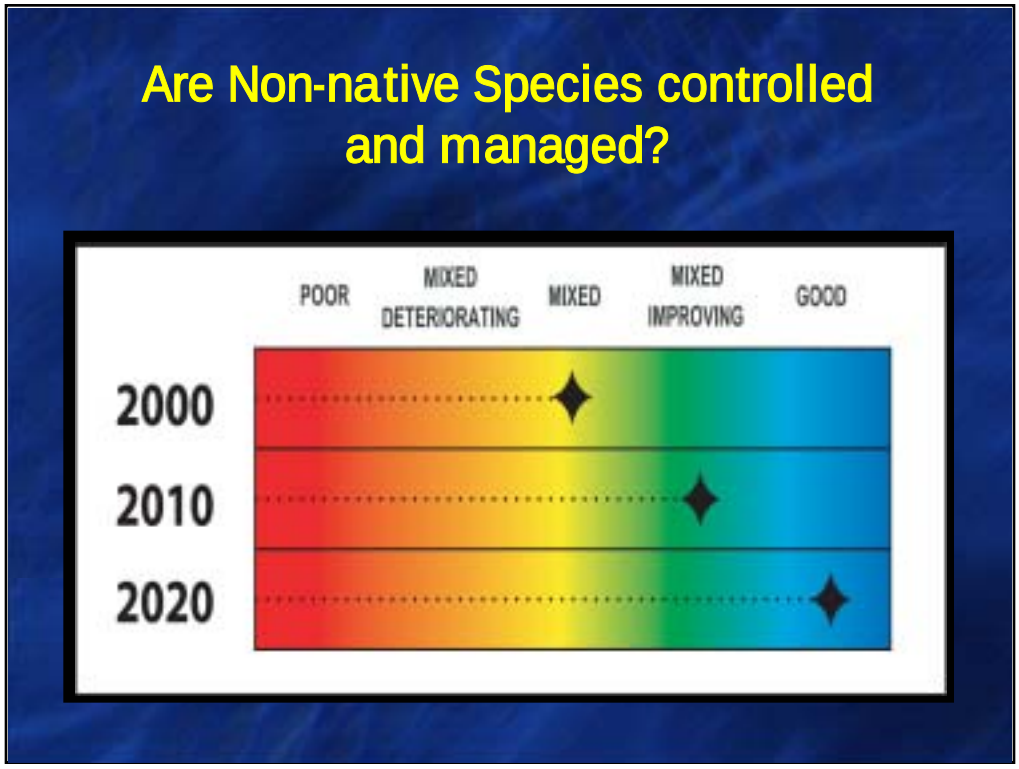
This Status Report is principally drawn from Lake Michigan LaMP 2002. The LaMP states two goals that address Biological Integrity. We will look at the status of these goals generally. Along the way we give examples of key information presented in reference to State, Stressor and Human Response themes. Along the way we will note unmet goals but also stop to celebrate a few successes among several keystone biological community integrators.



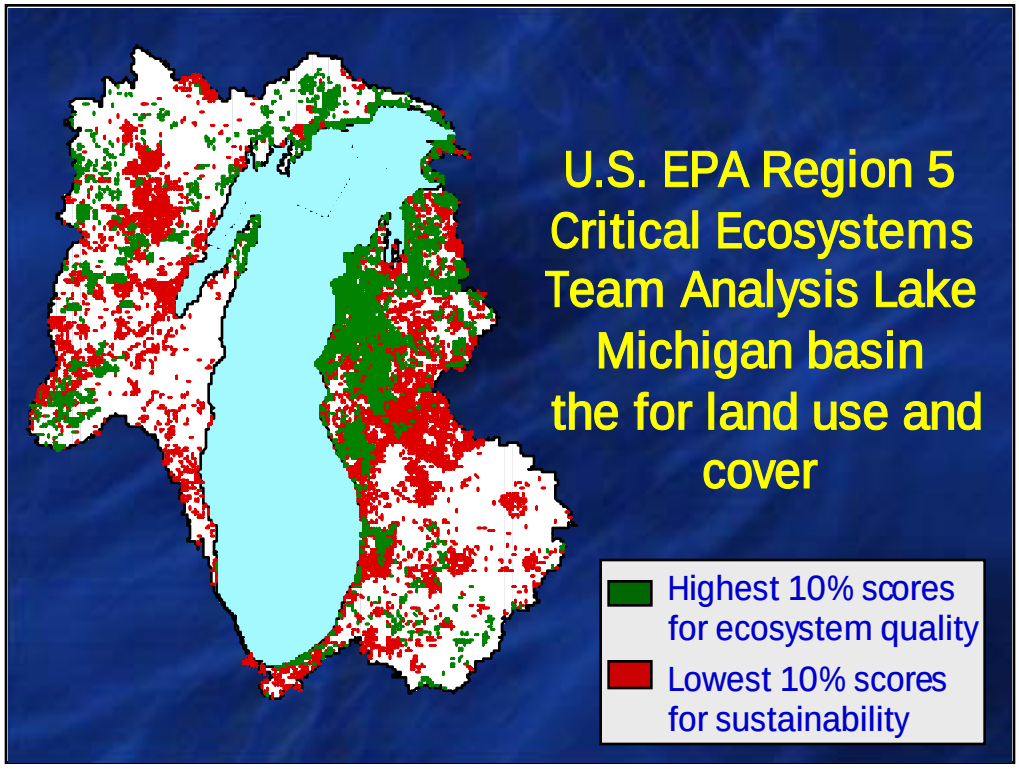
In terms of Biological Integrity, the LaMP is really divided into this sub-goal 4 with examples of

- Habitats and
- Biological communities

Self-rated at a weak “mixed” and the next one……..

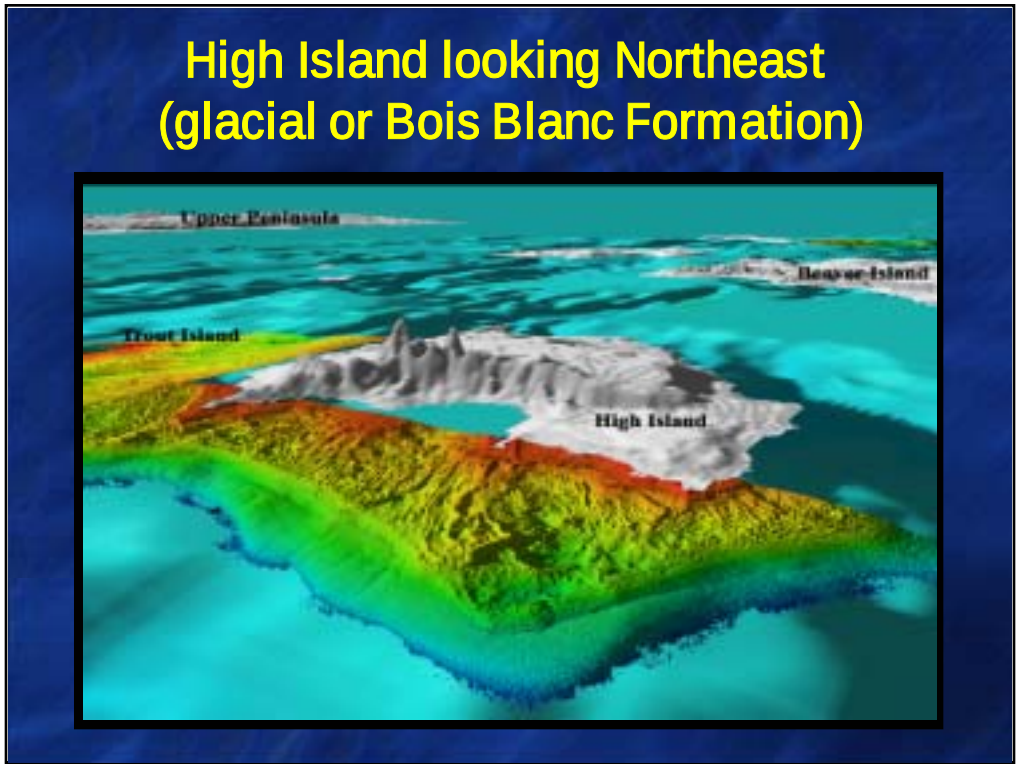


Where Non-native species issues are also addressed in sub-goal 8. The non-native species examples to come highlight a bit of how they affect the Status of both habitat and species that are globally rare and endangered, and are a causal factor, or "threat" documented in the listing of over half of federally-listed species.



In looking at habitat status, Lake Michigan watershed habitat is under stress due to development and fragmentation. The U.S. EPA Region 5 Critical Ecosystems Team analysis of land use and cover showed in GREEN areas where the highest 10% for ecosystem quality was often adjacent to areas shown in RED scored for lowest sustainability.

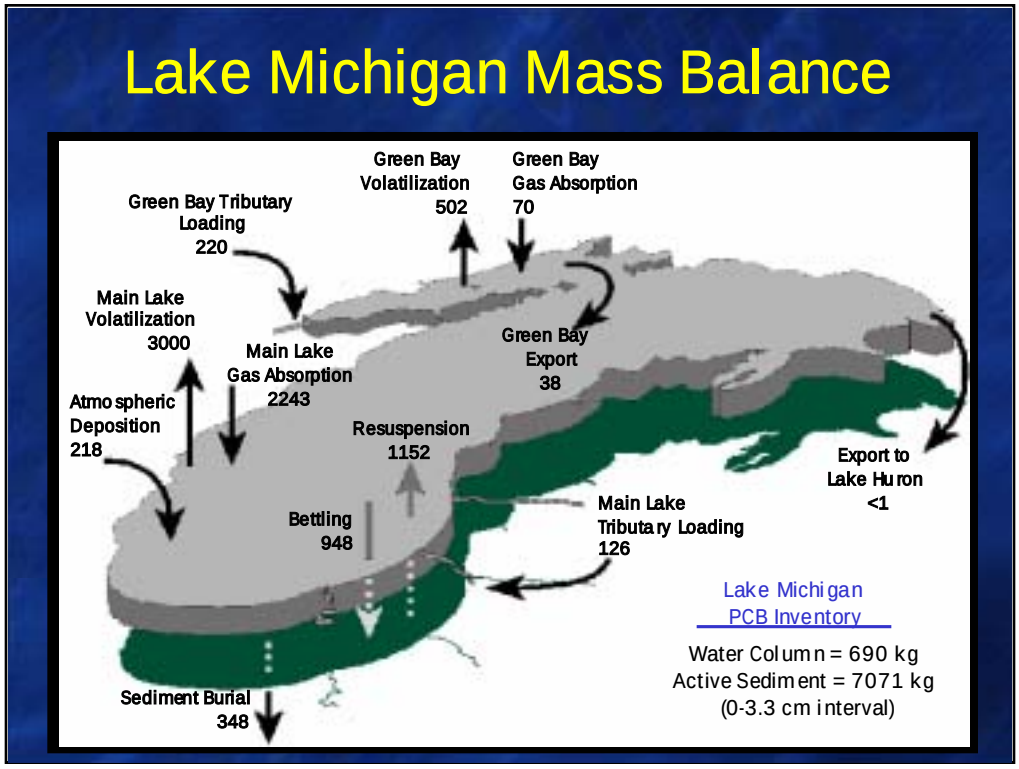
As for the status of Wetlands, Status and Trends reports have shown that Wetland loss is disproportionately greater in the Lake Michigan States than the U.S. average. The Human Response has been expressed and State and Local Jurisdictions have taken action to protect some categories of wetlands left unprotected due to a Supreme Court Ruling. Wisconsin was the first State to do so. A Wetland Consortium is working on monitoring projects to harmonize common terms and measures for indicators.



The status of the Lake Bottom has traditionally been poorly known. Here is an illustration of how detailed mapping of the bottom of Lake Michigan has begun with relief identification of ancient Lake Trout reefs. The unseen part of the Lake is a tremendous habitat resource now unfolding using new technologies already well-practiced on ocean bottoms. These reefs are of vital interest to the numerous species of spawning aquatic animals, as well as the many life stages of important parts of the food web of Lake Michigan.

A striking fact stands out on Dune Status—Lake Michigan's are the world's largest collection of fresh water Sand Dunes. (repeat)

They have only minimal legal protection. Research shows they are still active, changing and very vulnerable to human activity. The Human Response has been to intensify outreach and education efforts like the Habitat and Land use Tool box, released with this year's LaMP, and the online Lake Michigan Atlas coming out in 2003.



•Toxic contaminants continue as an important issue in Lake Michigan

•The Lake Michigan Mass Balance Study is in its final modeling phase.

•At the last SOLEC meeting, initial results for the mercury modeling were presented. Atrazine modeling is also completed.

•This diagram represents a preliminary PCB mass budget based on the Lake Michigan Mass Balance measurements made in 1994 and 1995.

•What is immediately evident is the size of the atmospheric input to the lake. The gas absorption of 2243 kilograms per year, plus atmospheric deposition of 216 kg per year, is roughly 20 times the main lake tributary load.

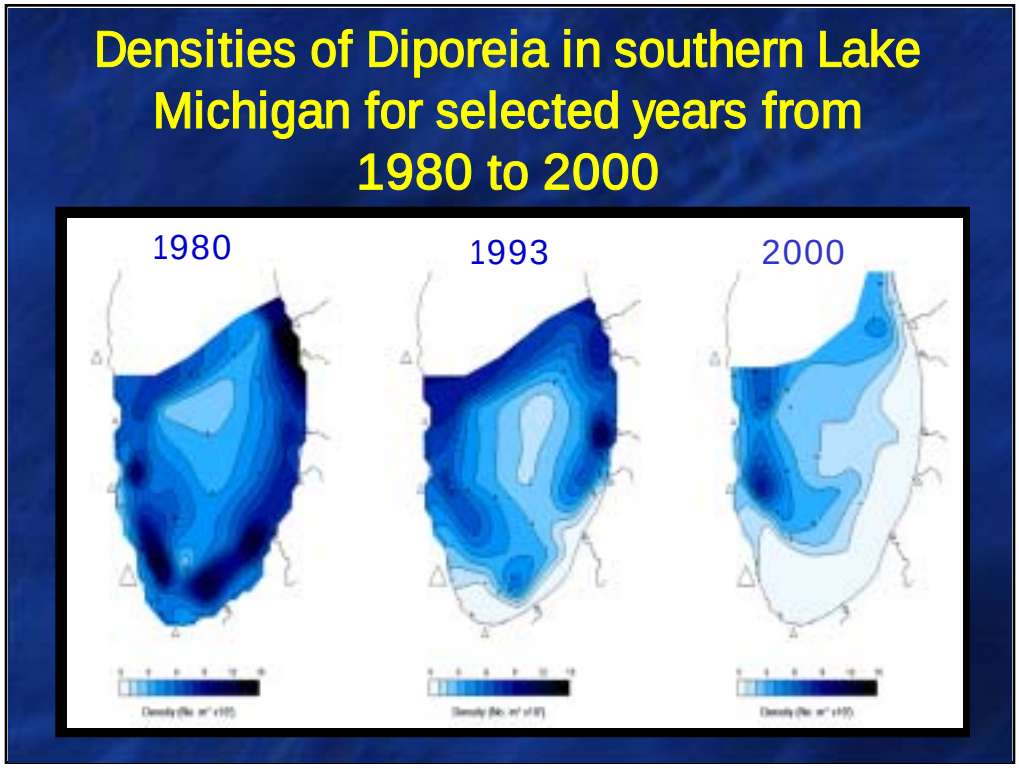
•It also appears that Lake Michigan is losing more PCB's to the atmosphere than it is receiving. There is some uncertainty about that. While we have recently recognized the importance of PCB's entering the lake from urban areas (Chicago and Milwaukee), we still haven't accounted for it all in our models.

•These are preliminary results, and more accurate, certain, results will be available in the coming months.

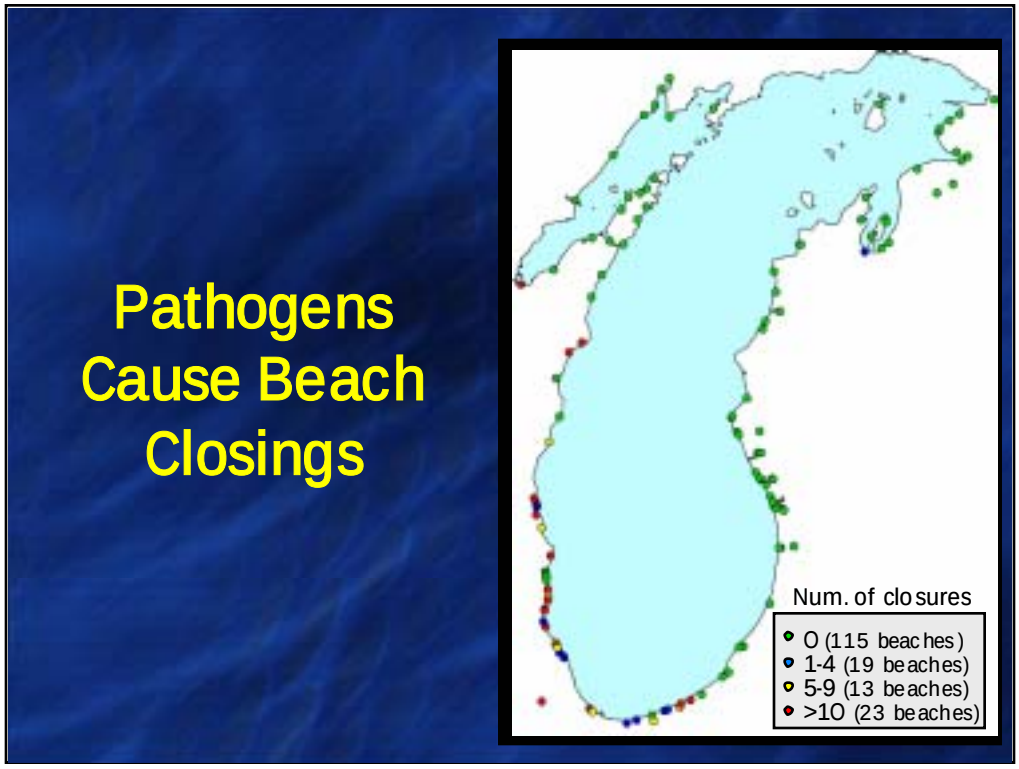
Biological Community status is also mixed. Here we have conflicting data, some Biological Communities are recovering, some are not.

A keystone species of the Northern Lake Michigan Biological Communities, the Gray Wolf, is recovering in Lake Michigan Basin – with the Great Lakes having the highest population in the contiguous US.

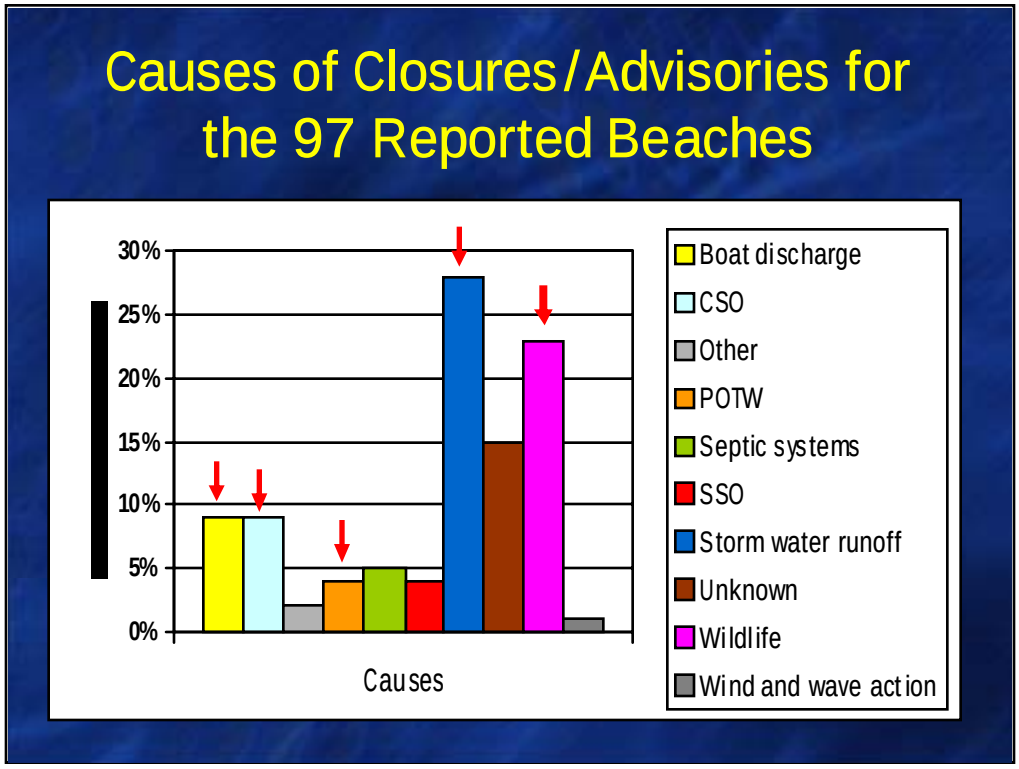
At the other end of the Biological Community recovery spectrum, the Lake Michigan aquatic food web shows signs of serious trouble. The invertebrate scud Diporeia is eaten by variety of fish and their high fat content provide important energy to drive the desireable food web.



Now recent studies show a disturbing Diporeia disappearance from Southern areas of the bottom of Lake Michigan. Speculation is the cause may be Zebra Mussel competition for food.

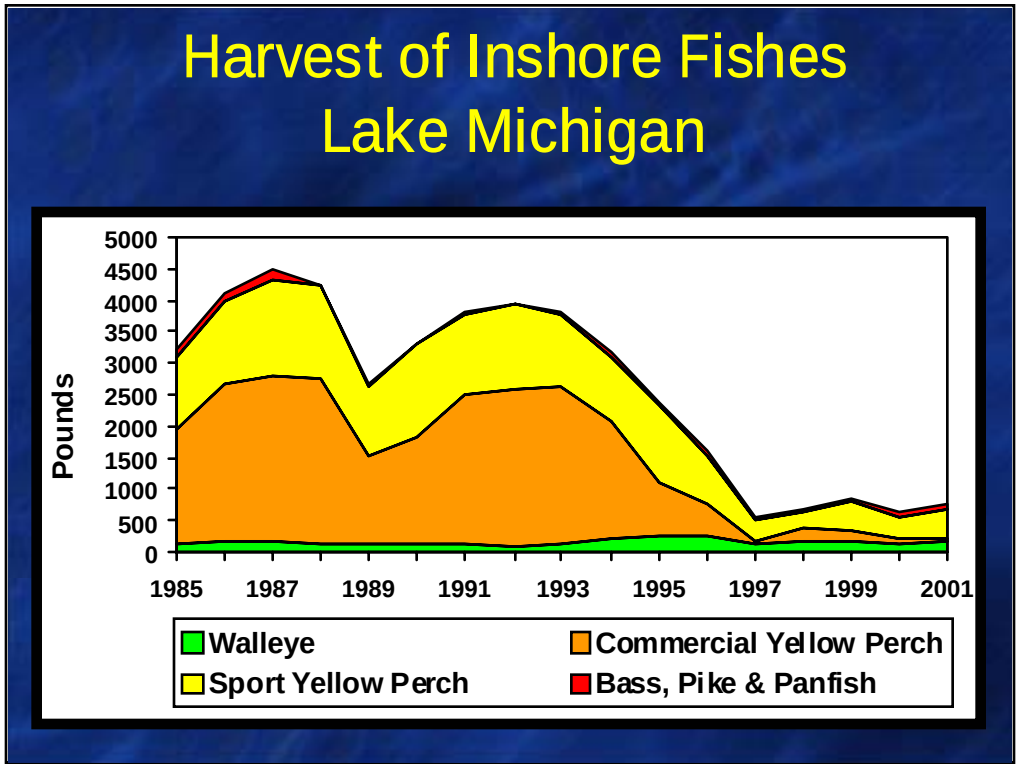


Another issue relating to biological integrity is beach closing. The human population is also affected as unsustainable practices relating to land use, sewage treatment, non-point sources and concentrations of wildlife from food web alterations continue to cause beach closing due to pathogens. The annual National Health Protection Beach survey shows that out of 170 Lake Michigan beaches responding, 97 closed and 23 out of that 97 closed more than 10 times in the 2001 season.



This graph shows the most common causes of beach closures for the 97 beaches that had closures or had advisories on Lake Michigan in 2001. Some beaches had one or more than one of these causes reported. For example, beaches were closed 148 times for "Storm water runoff" representing 28% of total closures, 123 times for "Wildlife" related causes (or 23%), 48 times for Combined Sewer Overflow (CSO) or 9%, 24 times for Publicly Owned Treatment Works (POTW) or 4%, 20 times for Sanitary Sewer Overflow (SSO) or 4% and 47 times for "boat discharges" or 9% of total causes of closures.

The Lake Michigan Fishery Report was given by Tom Trudean at SOLEC 2000. This most recent summary from Great Lakes Fishery Commission Committees shows that harvest, particularly commercial harvest, is down, that sport harvest has exceeded commercial, and that white fish, lake trout, chubs, yellow perch, planktivores, round white fish and sea lamprey were harvested below the Fish Communiting Objectives, while non-lake trout salmonids are achieving fish community objectives in terms of harvest.

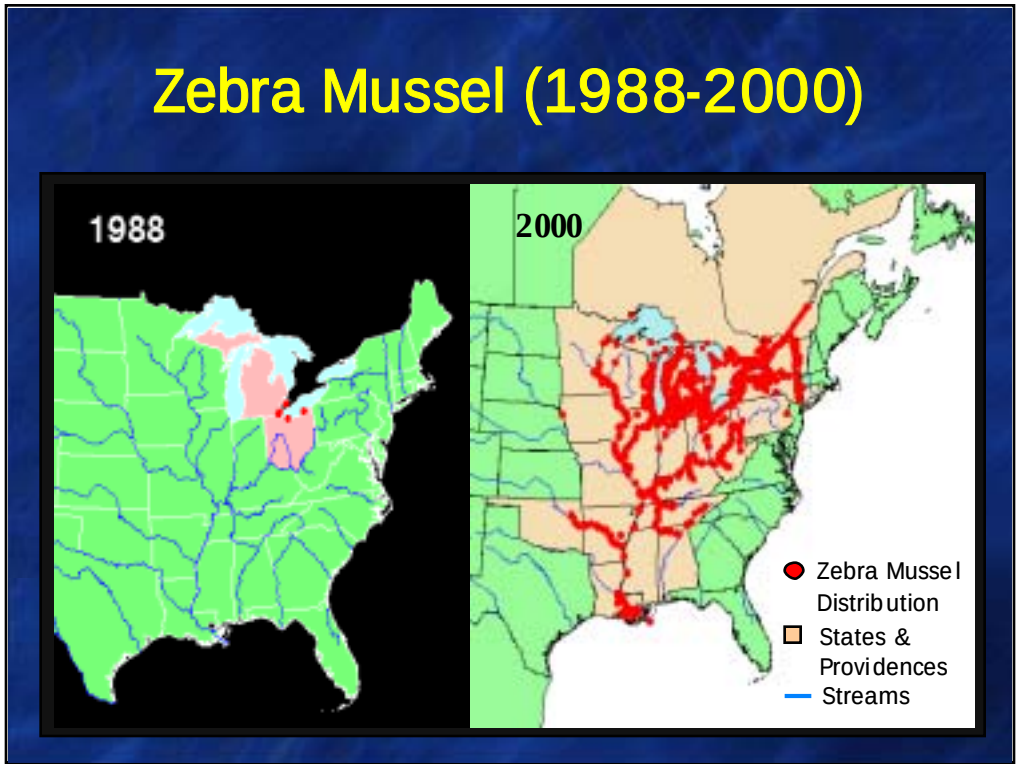


The trend line of inshore fish status shows the need to investigate and monitor this area.

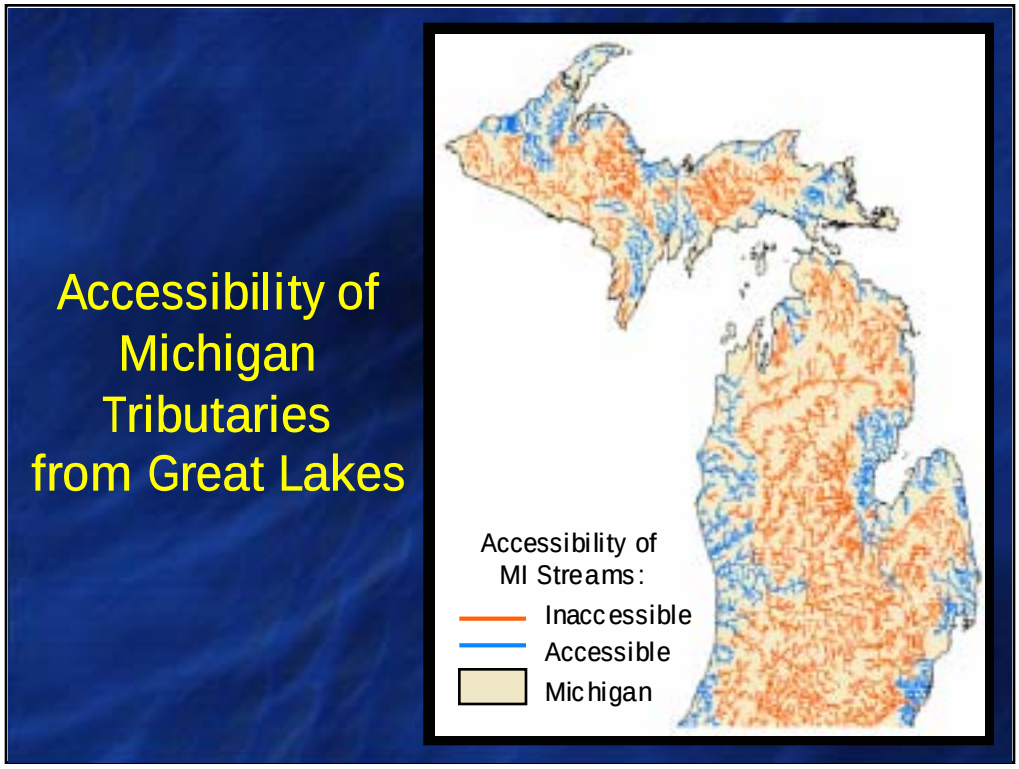
Headlines too often read something like: “Nuisance Species Spread”

What is the Status? Ruffe were found in Lake Michigan just this summer of 2002 by the US Fish and Wildlife Service, as part of the Ruffe Surveillance program. The Human response has been to both continue research and take prevention measures.

In the spring of 2002, an Electric Barrier on the Chicago Sanitary and Ship Canal was activated to slow goby spread and prevent Asian carp (seen here) entry to Lake Michigan. It is still being fine tuned against carp, and needs a backup and other enhancements, in a race against time.

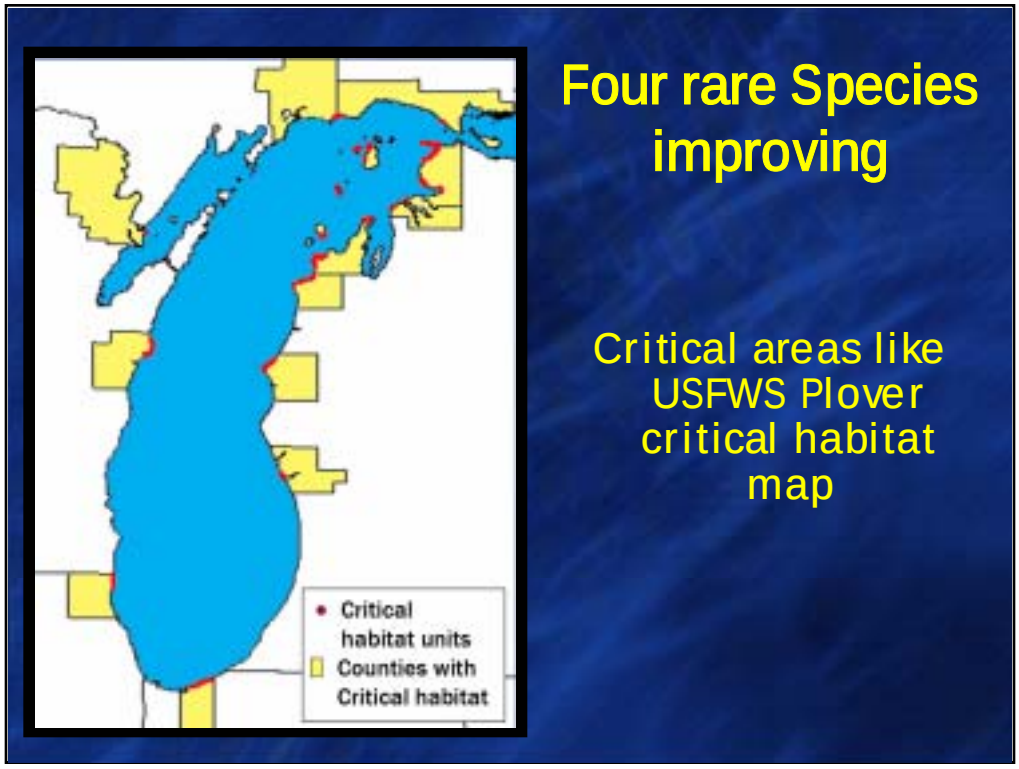


The news for Lake Michigan may well continue to be more troublesome than that for other lakes due to its connection with the Mississippi River system. There is a great deal of accessibility that these kinds of organisms can exploit, documented by the spread of the zebra mussel in eastern North America seen here.

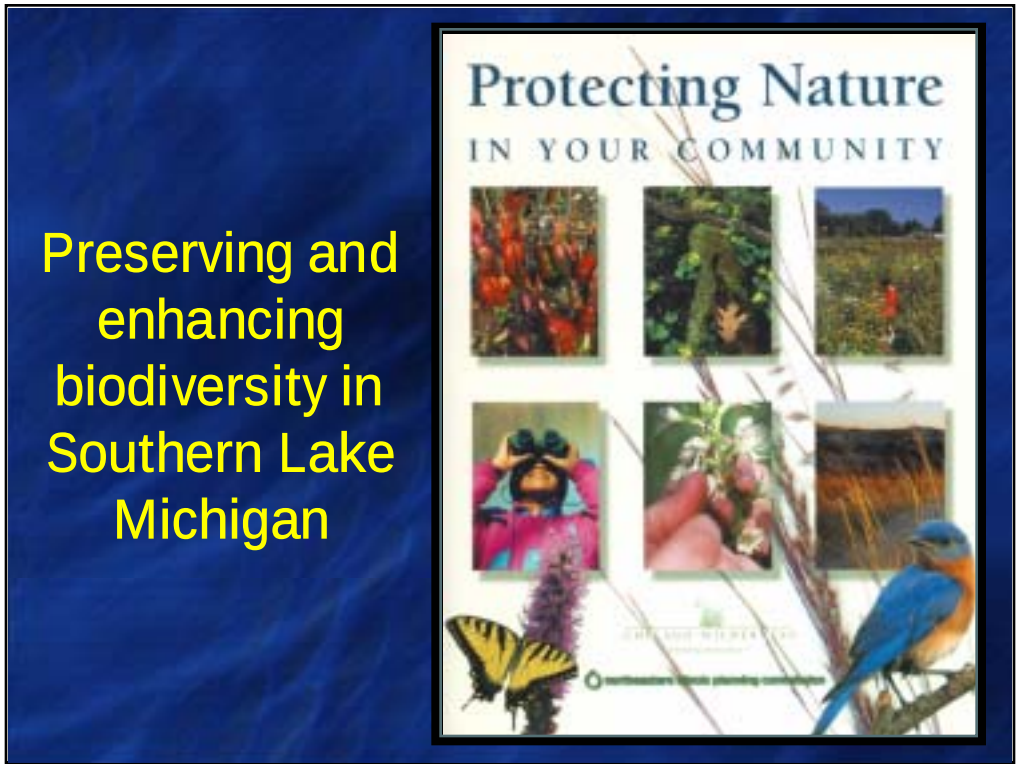


Here you can see accessible pathways for bait-bucket and other transfers among Great Lakes watersheds in just the keystone state of Michigan. I don't mean Pennsylvania, but rather the state between 4 of the 5 Great Lakes. Note the proximity of Lake Superior source streams to Lake Michigan receiving streams north of Escanaba where ruffe were recently discovered.

The Human response has been to draw attention to the problem. Like the Michigan Ballast Water legislation and research into ways to control the ballast water pathway. At the same time, an appropriate Human response is to celebrate success like bringing sea lamprey under control in such a diverse and difficult landscape. A long-term, heroic and ongoing effort to be proud of, to say the least.



We have an ongoing need to map the critical areas like USFWS Piping plover critical habitat map aimed at protecting a highly endangered species. The lion's share of critical habitat units, seen here in red, are in the Lake Michigan basin. Some other species benefiting from long-term heroic partnership efforts besides plover are the previously-mentioned improving wolf, bald eagle, and Kirtland's warbler, among others. These charismatic megavertebrates inspire us with hope for their respective biological communities, as does….



A consortium of organizations, Chicago Wilderness, which has produced the "Biodiversity Recovery Plan" documenting the state of the region's ecosystems and biodiversity and the actions necessary to restore them. Implementation of the recommendations of the plan has already begun with the Northeastern Illinois Planning Commission's "Protecting Nature in your Community: A Guidebook for Preserving and Enhancing Biodiversity". The guidebook is intended for local government audiences, and should be applied around the Lake.

In conclusion, the news from Lake Michigan is not all bad. Success and progress is being made through partnerships, as the original SOLEC Aquatic Habitat and Wetlands paper by Dodge et al, exhorted us to do. But certain geographic and other characteristics of the Lake Michigan basin may keep it in the "mixed" category for longer than we'd like. That paper also talked about a "common currency" we then sought, but to quote the science fiction actor, Rod Steiger, now gone, who played the "Illustrated Man" who's tattoos were a portal through time,-- "Success means controlling your own time. Time is the most important currency, but once you spend it, man, its gone."